



Runoff and erosion at the micro-plot and slope scale in a small burnt catchment, central Portugal

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Wildfires can have important impacts on hydrological processes and soil erosion in forest catchments, due to the destruction of vegetation cover and changes to soil properties. However, the processes involved are non-linear and not fully understood. This has severely limited the understanding on the impacts of wildfires, especially in the up-scaling from hillslopes to catchments; in consequence, current models are poorly adapted for burnt forest conditions.

The objective of this presentation is to give an overview of the hydrological response and sediment yield from the micro-plot to slope scale, in the first year following a wildfire (2008/2009) that burnt an entire catchment nearby the Colmeal village, central Portugal. The overview will focus on three slopes inside the catchment, with samples including:

- Runoff at micro-plot scale (12 bounded plots) and slope scale (12 open plots);
- Sediments and Organic Matter loss at micro-plot scale (12 bounded plots) and slope scale (12 open plots plus 3 Sediment fences);
- Rainfall and Soil moisture data;
- Soil Water Repellency and Ground Cover data.

The analysis of the first year following the wildfire clearly shows the complexity of runoff generation and the associated sediment transport in recently burnt areas, with pronounced differences between hillslopes and across spatial scales as well as with marked variations through time.

This work was performed in the framework of the EROSFIRE-II project (PTDC/AGR-CFL/70968/2006) which has as overall aim to predict soil erosion risk in recently burnt forest areas, including common post-fire forest management practices; the project focuses on the simultaneous measurement of runoff and soil erosion at multiple spatial scales. The results to be presented in this session are expected to show how sediment is generated, transported and exported in the Colmeal watershed; and contribute to understand and simulate erosion processes in burnt catchments, including for model development and evaluation.